AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Previously Presented) Method for detecting voice activity in a digital speech signal in at least one frequency band, wherein the voice activity is detected on the basis of an analysis comprising the step of comparing two different versions of the speech signal, wherein at least one of said versions is a denoised version obtained by taking account of estimates of noise included in the signal.

2. (Previously Presented) Method according to claim 1, wherein said comparison is performed on respective energies, evaluated in said frequency band, of the two different versions of the speech signal, or to a monotonic function of said energies.

3. (Currently Amended) Method according to claim 1, wherein said analysis further comprises a time smoothing of the energy of one of said versions of the speech signal, and a comparison between the energy of said version and the ~~smooth~~ smoothed energy.

4. (Currently Amended) Method according to claim 3, wherein the comparison between the energy of said version and the ~~smooth~~ smoothed energy controls transitions of a voice activity detection automaton from a speech state to a silence state, and wherein the comparison of the two different versions of the speech signal controls transitions of the detection automaton from the silence state to the speech state.

5. (Previously Presented) Method according to claim 1, wherein the two different versions of the speech signal are two versions denoised by non-linear spectral subtraction, wherein a first of the two versions is denoised in such a way as not to be less, in the spectral domain, than a first fraction of a long-term estimate representative of a noise component included in the speech signal, and the second of the two versions is denoised in such a way as not to be less, in the

spectral domain, than a second fraction of said long-term estimate, smaller than said first fraction.

6. (Previously Presented) Method according to claim 5, wherein said analysis further comprises a time smoothing of the energy of each of the two versions of the speech signal, by means of a smoothing window determined by comparing the energy of the second of the two versions with the smoothed energy of the second of the two versions.

7. (Previously Presented) Method according to claim 6, wherein the smoothing window is an exponential window defined by a forgetting factor.

8. (Previously Presented) Method according to claim 7, comprising the step of allocating a substantially zero value to the forgetting factor when the energy of the second of the two versions is less than a value of the order of the smoothed energy of the second of the two versions.

9. (Currently Amended) Method according to claim 8, comprising the step of allocating a first value substantially equal to 1 to the forgetting factor when the energy of the second of the two versions is greater than said value of the order of the ~~smooth~~ smoothed energy multiplied by a coefficient bigger than 1, and allocating a second value lying between 0 and said first value to the forgetting factor when the energy of the second of the two versions is greater than said value of the order of the smoothed energy and less than said value of the order of the smoothed energy multiplied by said coefficient.

10. (Currently Amended) Method according to claim ~~1~~ 5, wherein the first and second fractions correspond substantially to attenuations of 10 dB and 60 dB, respectively.

11. (Previously Presented) Method according to claim 1, wherein the comparison of the two different versions of the speech signal is performed on respective differences between the

energies of said two versions in said frequency band and a lower bound of the energy of the denoised version of the speech signal in said frequency band.

12. (Previously Presented) Method according to claim 11, wherein one of the two different versions of the speech signal is a non-denoised version of the speech signal.

13. (Previously Presented) Device for detecting voice activity in a speech signal, comprising signal processing means for analyzing the speech signal in at least one frequency band, wherein the processing means comprise means for comparing two different versions of the speech signal, wherein at least one of said versions is a denoised version, obtained by taking account of estimates of noise included in the signal.

14. – 15. (Cancelled)

16. (Previously Presented) Device according to claim 13, wherein the processing means comprise means for evaluating, in said frequency band, energies of said two different versions of the speech signal, whereby inputs of the comparison means comprise said energies or a monotonic function of said energies.

17. (Previously Presented) Device according to claim 13, wherein the processing means further comprises means for performing a time smoothing of the energy of one of said versions of the speech signal, and means for comparing the energy of said version and the smoothed energy.

18. (Previously Presented) Device according to claim 17, wherein the processing means comprise a voice activity detection automaton having a plurality of states including a speech state and a silence state, means for controlling transitions of the voice activity detection automaton from the speech state to the silence state based on a comparison between the energy of said version and the smoothed energy, and means for controlling transitions of the voice

activity detection automaton from the silence state to the speech state based on a comparison of the two different versions of the speech signal.

19. (Previously Presented) Device according to claim 13, further comprising first non-linear spectral subtraction means to provide a first of the two versions of the speech signal as a denoised version which is not less, in the spectral domain, than a first fraction of a long-term estimate representative of a noise component included in the speech signal, and second non-linear spectral subtraction means to provide a second of the two versions of the speech signal as a denoised version which is not less, in the spectral domain, than a second fraction of said long-term estimate, said second fraction being smaller than said first fraction.

20. (Currently Amended) Device according to claim 19, wherein the processing means further comprises means for performing a time smoothing of the energy of each of the two versions of the speech signal, by means of a smoothing window determined by comparing an energy of the second of the two versions with the ~~smoothing~~ smoothed energy of the second of the two versions.

21. (Previously Presented) Device according to claim 20, wherein the smoothing window is an exponential window defined by a forgetting factor.

22. (Previously Presented) Device according to claim 21, wherein the processing means further comprises means for allocating a substantially zero value to the forgetting factor when the energy of the second of the two versions is less than a value of the order of the smoothed energy of the second of the two versions.

23. (Currently Amended) Device according to claim 22, wherein the processing means further comprises means for allocating a first value substantially equal to 1 to the forgetting factor when the energy of the second of the two versions is greater than said value of the order of the smoothed energy multiplied by a coefficient bigger than 1, and for allocating a second value lying between 0 and said first value to the forgetting factor when the energy of the second of the

two versions is greater than said value of the order of the smoothed energy and less than said value of the order of the ~~smooth~~ smoothed energy multiplied by said coefficient.

24. (Currently Amended) Device according to claim 19 ~~13~~, wherein the first and second fractions correspond substantially to attenuations of 10 dB and 60 dB, respectively.

25. (Previously Presented) Device according to claim 13, wherein the comparison of the two different versions of the speech signal is performed on respective differences between the energies of said two versions in said frequency band and a lower bound of the energy of the denoised version of the speech signal in said frequency band.

26. (Previously Presented) Device according to claim 25, wherein one of the two different versions of the speech signal is a non-denoised version of the speech signal.

27. (Previously Presented) A computer program product, loadable into a memory associated with a processor, and comprising portions of code for execution by the processor to detect voice activity in an input digital speech signal in at least one frequency band, whereby the voice activity is detected on the basis of an analysis comprising the step of comparing two different versions of the speech signal, wherein at least one of said versions is a denoised version obtained by taking account of estimates of noise included in the signal.

28. (Previously Presented) A computer program product according to claim 27, wherein said comparison is performed on respective energies, evaluated in said frequency band, of the two different versions of the speech signal, or to a monotonic function of said energies.

29. (Currently Amended) A computer program product according to claim 27 ~~1~~, wherein said analysis further comprises a time smoothing of the energy of one of said versions of the speech signal, and a comparison between the energy of said version and ~~of~~ the smoothed energy.

30. (Previously Presented) A computer program product according to claim 29, wherein the comparison between the energy of said version and the smoothed energy controls transitions of a voice activity detection automaton from a speech state to a silence state, and wherein the comparison of the two different versions of the speech signal controls transitions of the detection automaton from the silence state to the speech state.

31. (Previously Presented) A computer program product according to claim 27, wherein the two different versions of the speech signal are two versions denoised by non-linear spectral subtraction, wherein a first of the two versions is denoised in such a way as not to be less, in the spectral domain, than a first fraction of a long-term estimate representative of a noise component included in the speech signal, and the second of the two versions is denoised in such a way as not to be less, in the spectral domain, than a second fraction of said long-term estimate, smaller than said first fraction.

32. (Previously Presented) A computer program product according to claim 31, wherein said analysis further comprises a time smoothing of the energy of each of the two versions of the speech signal, by means of a smoothing window determined by comparing the energy of the second of the two versions with the smoothed energy of the second of the two versions.

33. (Previously Presented) A computer program product according to claim 32, wherein the smoothing window is an exponential window defined by a forgetting factor.

34. (Previously Presented) A computer program product according to claim 33, wherein said analysis further comprises the step of allocating a substantially zero value to the forgetting factor when the energy of the second of the two versions is less than a value of the order of the smoothed energy of the second of the two versions.

35. (Previously Presented) A computer program product according to claim 34, wherein said analysis further comprises the steps of allocating a first value substantially equal to 1 to the forgetting factor when the energy of the second of the two versions is greater than said value of

the order of the smoothed energy multiplied by a coefficient bigger than 1, and allocating a second value lying between 0 and said first value to the forgetting factor when the energy of the second of the two versions is greater than said value of the order of the smoothed energy and less than said value of the order of the smoothed energy multiplied by said coefficient.

36. (Currently Amended) A computer program product according to claim 31 ~~27~~, wherein the first and second fractions correspond substantially to attenuations of 10 dB and 60 dB, respectively.

37. (Previously Presented) A computer program product according to claim 27, wherein the comparison of the two different versions of the speech signal is performed on respective differences between the energies of said two versions in said frequency band and a lower bound of the energy of the denoised version of the speech signal in said frequency band.

38. (Previously Presented) A computer program product according to claim 37, wherein one of the two different versions of the speech signal is a non-denoised version of the speech signal.